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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/865,763	05/25/2001	Vlad Mitlin	3Com-86 (3611.DSL.US.P)	5768
7265	7590	02/04/2005	EXAMINER WARE, CICELY Q	
MICHAELSON AND WALLACE PARKWAY 109 OFFICE CENTER 328 NEWMAN SPRINGS RD P O BOX 8489 RED BANK, NJ 07701			ART UNIT 2634	PAPER NUMBER

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/865,763

Applicant(s)

MITLIN, VLAD

Examiner

Cicely Ware

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 8, 19, 23, 26-28, 31 and 32 is/are rejected.
- 7) ☒ Claim(s) 4-6, 9-18, 20-22, 24, 25, 29, 30 and 33-42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because:

- a. Pg. 55, line 1, applicant uses the phrase "A method, and apparatus".

Examiner suggests applicant use "A method and apparatus" for clarification purposes.

Correction is required. See MPEP § 608.01(b).

2. The disclosure is objected to because of the following informalities:

- a. Pg. 1, line 24, examiner suggests applicant use a consistent font for the disclosure for clarification purposes.

- b. Pg. 4, line 10, applicant uses the phrase "bits that approaches $\frac{1}{2}$ ".

Examiner suggests using "bits that approach $\frac{1}{2}$ " for clarification purposes.

Appropriate correction is required.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

4. Claims 12 and 19 are objected to because of the following informalities:

- a. Claim 12, line 2, applicant uses the phrase "tends to the square".

Examiner suggests using "tends to be the square" for clarification purposes.

Appropriate correction is required.

b. Claim 19, line 4, examiner suggests applicant indent this line for clarification purposes.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1 and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Wu et al. (US Patent 6,134,273).

(1) With regard to claim 1, Wu et al. discloses a method of selecting a bit load per sub-channel in a multicarrier system, the multicarrier system encoding data based on a constellation of points, each point representing a tuple of data, the constellation having a self-similarity property, comprising: selecting the bit load per sub-channel based on the self-similarity property of the constellation (col. 1, lines 16-22, col. 2, lines 25-67, Table 1).

(2) With regard to claim 8, claim 8 inherits all the limitations of claim 1. Wu et al. further discloses wherein said constellation is square (Fig. 1, Fig. 2).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2634

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US Patent 6,134,273) as applied to claim 2 above, in view of Beidas et al. (US Patent 6,608,874).

(1) With regard to claim 3, claim 3 inherits all the limitations of claim 2. However Wu et al. does not disclose determining an average number of bit errors in an erroneous tuple based on said probability and selecting is also based on the average number of bit errors in the erroneous tuple.

However Beidas et al. discloses determining an average number of bit errors in an erroneous tuple based on said probability and selecting is also based on the average number of bit errors in the erroneous tuple (col. 12, lines 40-65).

Therefore it would have been obvious to one of ordinary skill in the art to modify Wu et al. in view of Beidas et al. to incorporate determining an average number of bit errors in an erroneous tuple based on said probability and selecting is also based on the average number of bit errors in the erroneous tuple in order to quantify the ability of the quadrature multi-pulse demodulator to suppress interference in the received data (Beidas et al., col. 12, lines 65-67).

(2) With regard to claim 7, claim 7 inherits all the limitations of claim 2. Beidas et al. further discloses wherein the probability approaches $1/2^k$ for constellations which have large values of b col. 12, lines 40-65).

9. Claims 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US Patent 6,134,273) as applied to claim 1 above, in view of Mantri et al. (US Patent 6,732,281).

(1) With regard to claim 19, claim 19 inherits all the limitations of claim 1.

However Wu et al. does not disclose a method of selecting a bit load for a channel.

However Mantri et al. discloses a method of selecting a bit load for a channel (col. 1, lines 56-67. col. 2, lines 1-15).

Therefore it would have been obvious to one of ordinary skill in the art to modify Wu et al. in view of Mantri et al. to incorporate a method of selecting a bit load for a channel in order to maximize performance and minimize error probability at any data specific rate (Mantri et al., col. 2, lines 3-4).

(2) With regard to claim 23, claim 23 inherits all the limitations of claims 1 and 19.

10. Claims 2, 26, 27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US Patent 6,134,273) as applied to claim 1 above, in view of Isaksson et al. (US Patent 6,538,986).

(1) With regard to claim 2, claim 2 inherits all the limitations of claim 1. However Wu et al. does not disclose determining a probability of having k bit errors in an erroneous tuple based on the self-similarity property of the constellation.

However Isaksson et al. discloses determining a probability of having k bit errors in an erroneous tuple based on the self-similarity property of the constellation (col. 19, lines 3-38, col. 20, lines 33-43).

Therefore it would have been obvious to one of ordinary skill in the art to modify Wu et al. in view of Isaksson et al. to incorporate determining a probability of having k bit errors in an erroneous tuple based on the self-similarity property of the constellation in order to reduce the probability of bit errors and decrease the bit error rate (Isaksson et al., col. 7, lines 38-39, col. 20, line 33).

(2) With regard to claim 26, claim 26 inherits all the limitations of claim 1. However Isaksson et al. discloses means for determining a bit load per sub-channel based on the self-similarity property of the constellation based on an average fraction of bit errors in an erroneous tuple and forward error correction parameters; means for determining a coding gain based on said determined bit load, and forward error correction parameters; and means for selecting a bit load based on the coding gain (col. 6, lines 21-46, col. 7, lines 35-39, col. 8, lines 32-35, col. 19, lines 3-38, col. 20, lines 33-43).

(3) With regard to claim 27, claim 27 inherits all the limitations of claim 26. Wu et al. further discloses determining a probability of having k bit errors in an erroneous tuple based on the self-similarity property of the constellation (col. 2, lines 42-64).

(4) With regard to claim 32, claim 32 inherits all the limitations of claim 26. Wu et al. further discloses wherein said constellation is square (Fig. 1, Fig. 2).

11. Claims 28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US Patent 6,134,273) in combination with Isaksson et al. (US Patent 6,538,986) as applied to claim 26, in view of Beidas et al. (US Patent 6,608,874).

(1) With regard to claim 28, claim 28 inherits all the limitations of claim 26. Wu et al. in combination with Isaksson et al. disclose all the limitations of claim 26. However Wu et al. in combination with Isaksson et al. do not disclose determining the probability comprises determining an average number of bit errors in the erroneous tuple based on the probability and means for selecting also selects the bit load based on the average number of bit errors.

However Beidas et al. discloses determining the probability comprises determining an average number of bit errors in the erroneous tuple based on the probability and means for selecting also selects the bit load based on the average number of bit errors (col. 12, lines 40-65).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Wu et al. in combination with Isaksson et al. in view of Beidas et al. to incorporate determining an average number of bit errors in the erroneous tuple based on the probability and means for selecting also selects the bit load based on the average number of bit errors in order to quantify the ability of the quadrature multi-pulse demodulator to suppress interference in the received data (Beidas et al., col. 12, lines 65-67).

(2) With regard to claim 31, claim 31 inherits all the limitations of claim 26. Beidas et al. further discloses wherein the probability approaches $1/2^k$ for constellations, which have large values of b (col. 12, lines 40-65).

Allowable Subject Matter

12. Claims 4-6, 9-18, 20-22, 24, 25, 29, 30, 33-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method of selecting a bit load per sub-channel in a multi-carrier system. Prior art references show similar methods but fail to teach: **“wherein said average number of bit errors in the erroneous tuple is determined as $w(b) = 12(2^b) - (3b+2)2^{b/2} - 2b - 4/6b(2^b)$ ”, as in claim 4; “the probability $p(k,b)$ ”, as in claims 5, 29; “the probability $p(k,b)$ is determined”, as in claims 6, 30; “wherein said constellation is non-square”, as in claims 9, 16, 17, 25, 33, 40, 41; “determining a mean square deviation of the number of bit errors in an erroneous tuple”, as in claims 10, 11, 20, 24, 34, 35; “wherein at large values of b , the mean square deviation of the number of bit errors in an erroneous tuple tends to be the square root of two”, as in claims 12, 36; “access in a table of associated values of the number of bits and the values of the mean square deviation of the number of bit errors in an erroneous tuple to retrieve a value of a particular mean square deviation of the number of bit errors in an erroneous tuple for a particular value of b ”, as in claims 13, 37; “selecting at least one forward error correction parameter based on said adjusted target bit error rate”, as in claims 14, 38; “determining a probability of having k bit errors in an erroneously decoded tuple”, as in claims 15, 39; “a parameter having said self-similarity property is a**

**Hamming distance of the points of the constellation”, as in claims 18, 22, 42;
“determining a probability of having k bit errors in an erroneously decoded tuple
based on the self-similarity property of the constellation, wherein said probability
of having bit errors in an erroneously decoded tuple of the non-square
constellation is estimated as if said non-square constellation was a square
constellation”, as in claim 21.**

Conclusion

13. The prior art made record of and not relied upon is considered pertinent to applicant's disclosure:

- a. Brown et al. US Application US 2002/0093913 discloses a method and apparatus for dynamically allocating resources in a communication system.
- b. ISAKSSON et al. US Application US 2002/0126768 discloses control channels for telecommunications transmission systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Art Unit: 2634

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
January 11, 2005


AMANDA T. LE
PRIMARY EXAMINER